

TRAVEL BY TRAIN

The Largest Building in the West

The Denver Union Depot, located at 17th and Wynkoop, opened to the public on June 1, 1881. Constructed by the Union Depot and Railroad Company of Colorado, it was the largest building in the West at 500 feet long and 65 feet wide. The iconic structure was known for its 180 foot wooden clock and pointed arches. Shortly after opening to the public the Depot was hosting between 60 to 80 trains each day heading to both mining towns and Plains cities.

1894 brought significant changes for the station. A portion had to be rebuilt after an electrical fire and the original Depot center was demolished due to increasing railroad operations and travel volume. In 1906, the 'Welcome' arch was constructed; welcoming travelers for the next 25 years. The renovations were completed in 1914 and the Depot was renamed Denver Union Station. The iconic "Travel by Train" signs were added over the exterior clocks - their bright orange glow dubbed a new neighborhood landmark.

With years of harsh Rocky Mountain winters and an influx of new Denver residents, the iconic arch was eventually deemed a hazard and was taken down in 1931.

The west continued its explosive growth and Denver was no exception. In 2001, Denver Union Station was purchased by an RTD organized consortium who has since been implementing a 'master plan' with the intent of creating one of the nation's largest transportation hubs. Construction began on December 3, 2012 and in July of 2014, on its 100th Anniversary, Denver Union Station reopened to serve the Mile High City.

The new elegant and modern Denver Union Station is a mixed-use, transit-oriented hub featuring The Crawford Hotel, a 112-room independent hotel on the upper levels; 22,000 square-feet of ground floor space for up to ten independent retail and restaurant operations; 12,000 square-feet of public common space; the 'Great Hall' and 4,000 square-feet of outdoor plaza space - all created with a faithful and confident nod to the iconic history that has played a vital role in the growth of Colorado and its capital city.

The Team

To help bring their conceived facility to life, Sage Hospitality Group, Larimer & Associates and Amtrak - partnered with Milender White Construction Company (general contractor) and Tryba Architects (architect). With a proven track record of successfully completing complex multi-use downtown projects, RK Mechanical, Inc. was selected as the mechanical contractor of choice for the Denver Union Station Hotel project, now known as The Crawford Hotel.

All Hands on Deck

There were a number of scheduling challenges on the project that occurred before RK was actually on-site including delays on large-scale orders of equipment from factories. These factors had a ripple effect that stalled the rough-in finish on floors near the end of the project. To combat the unforeseen delays, the project team created weekly plans and schedules that included an extra meeting and walk-through of each floor with all trades. After the meeting and walk-through, the combined crew of trades would put together one week schedules outlining trade specific tasks with extremely tight sequencing. Each activity had a ‘sign-off’ that was posted on the floor plan to document that each trade was progressing as planned - this let the subsequent trade know what work was then available to them. Through this process, the team was able to overcome the project delays and stay within the original contract schedule.

Value Added

With the RK Mechanical team, value engineering and project alternative selection is a systematic and organized process that benefits the owner and construction team. RK Mechanical’s level of experience in selecting equipment, systems options and constructability all play a major role in the value engineering effort. On the Denver Union Station Hotel project, the RK team followed strict processes to keep the project within budget, while maintaining the integrity of the design including:

- Focus on the constructability.
- Review system configurations.
- Review equipment selection alternatives of comparable quality and performance.
- Maximization of temperature differentials with respect to water and air in order to minimize pipe and duct sizing.
- Review of control systems and recommend simple, cost-effective ways to assemble a control package without compromising the integrity of the design.
- Review requirements for component construction and suggest alternate lowest cost materials.

In addition to the processes mentioned above, at the beginning of the project the team conducted multiple value analyses on existing systems including a review of the existing storm system. The team found that it was in perfect condition and could be reused. This discovery meant no additional money would be necessary to replace or update the existing storm system, saving money for both the general contractor and the project owners.

The Unexpected

One of the main difficulties encountered in completing the project was an incorrect existing structural 3D model. The 3D model that was provided to the team for coordination and installation purposes was wrong. This error meant that when the CAD department drew in pipe or duct it was often in conflict with existing structural beams or columns. To correct this potentially disastrous issue, the team placed two dedicated CAD team members on-site and left a field person at their disposal. The selected field person would run back and forth from the on-site CAD station to various structural elements within the building to verify the location of actual beams and columns. The RK crew was able to correct the structural model so it could be used as a tool to properly coordinate installation on the rest of the project.

Safety + Quality

As an ISO 9001:2008, ASME and AISC certified contractor and OSHA VPP Star Mobile Workforce accredited company, RK Mechanical is rooted in tested processes designed to deliver predictable results. Surprise internal ISO audits throughout the duration of the project helped to ensure that the team was “doing what they said they would do” with the appropriately trained and certified personnel as well as properly documenting progress along the way.

Tracking deficiencies while building a hotel can be difficult due to the sheer number of rooms and spaces. Without a system to thoroughly document installation, it's likely that quality could slip, creating lengthy punchlists. To avoid any unforeseen errors on the Denver Union Station Hotel, RK Mechanical implemented BlueBeam Studio software.

The team loaded drawings onto Bluebeam Studio and coordinated walks with small business partners to ensure transparency and open communication. By using Studio the team was able to do live updates to the drawings so that crews could walk the building and update the drawings at the same time.

In addition to BlueBeam, quality deficiencies were noted and photographed and the pictures were posted directly to the drawings and rooms where the issues occurred. These drawings were then shared with the entire construction team so that crews could stay on the same page and correct outstanding items.

Daily “stretch-and-bend” meetings were conducted and allowed each team member the opportunity to familiarize themselves with the day’s tasks and ask any questions. Pre-task cards were used to plan work and anticipate challenges and/or special equipment required to effectively complete the job. Weekly safety meetings and ongoing skill training were also a part of RK Mechanical’s proactive approach to safety.

Building History on Top of History

Since first opening in 1881, the Station has served World War I and II soldiers, presidents and even the Queen of Romania. The building survived the 1993 Cherry Creek flood and a great fire that burned down one of the original wooden towers. Due to its rich history and meaningful presence in Colorado, the transit hub has been a venue worth saving and because of that it became one of the most difficult challenges of the project. The project team was forced to work with and abide by the historical requirements set in place by the National Park Service (NPS). An agency of the United States federal government, the NPS manages all U.S. national parks, monuments and other conservation and historical properties. During the construction process the NPS would randomly walk the jobsite and make special requests they deemed necessary to preserve the historical integrity of the building. It was nearly impossible for the construction team to anticipate what the NPS would find, often making their visits disruptive to work flow and schedules. However, while it was a great challenge to meet their high expectations while being mindful of budgetary concerns, RK Mechanical values the role it played in restoring the historic facility.

History Got a Makeover

“Step through any of the Denver Union Station entrances and you’ll automatically see that history got a makeover. Every detail of our stunning Great Hall space pays homage to a pioneer spirit while embracing a truly modern sensibility.” The Denver Union Station website clearly identifies the historic venue’s greatest attributes, highlighting the majestic old parts and pieces tied in with the snazzy new look. A project to be proud of, RK Mechanical places the Denver Union Station Hotel at the top of its downtown Denver resume.



The RK Team Flying in Cooling Units



The RK Team Setting Equipment



Exterior Progress on the Fourth Floor



In-Progress Aerial of Project Site



Scaffolding in the Main Atrium / Ballroom



Finished Aerial of the Project Site